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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHEN, TIANJIE

ART UNIT	PAPER NUMBER
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2627

DATE MAILED: 08/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/645,815	Applicant(s) BOUTAGHOU ET AL.	
	Examiner Tianjie Chen	Art Unit 2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 and 28-33 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21, 28-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Final Rejection

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-8, 12-19, 28-31, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schott (US 6,349,017) in view of Tam et al (US 5,421,943) (note: a typo in previous Office action is corrected here).

Claim 1, Schott shows a suspension assembly 10 in Fig. 5, slider body 16 having a trailing edge 52B (Column 4, lines 38-40), a bond pad 54A positioned on the trailing edge face; a conductive trace 34A connected to the bond pad to form an electrical connection; and the electric connection is accomplished by low temperature bonding method – ultrasonic vibration (Column 5, lines 6-10).

Schott does not show a heating element including a low resistivity portion and a high resistivity portion, the high resistivity portion positioned proximate the electrical connection in the combined device; and an insulating component positioned between the conductive trace and the heating element proximate the electrical connection, a heating element proximate the electrical connection.

Tam et al shows a bonding method, which includes a heating element including a low resistivity portion 53 (Fig. 3D) and a high resistivity portion 51, the high resistivity portion 51, the high resistivity portion positioned proximate the

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element 26 to be bonded (Fig. 2), and an insulating component 24 (Fig. 5) positioned between the element to be bonded.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to apply tam et al's method to replace the ultrasonic method used in Schott's method to accomplish the bonding. The rationale is as follows: Schott uses a low temperature ultrasonic method in bonding the wires and bonding pads. Tam et al teaches that a low temperature bond may not provide sufficient strength and stability (Column 1, lines 26-29) and his invention can overcome this problem for bonding heat sensitive chips (Column 1, lines 11-15). Tam's device includes magnetic head, which is heat sensitive element. One of ordinary skill in the art would have been motivated to apply Tam et al's method to provide sufficient strength and stability. In such constructed method, the insulating component would have been positioned between the conductive trace and the heating element proximate the electrical connection.

Claim 2, the high resistivity portion 51 has a smaller thickness than the low resistivity portion 53 (Fig. 3D).

Claim 3. Tam's Fig. 3A shows the high resistivity portion includes an undulating pattern positioned proximate the bond pad.

Claim 4. Schott shows four bond pads 54A-D are positioned on the trailing edge face and four conductive traces 34A-D are connected to the four bond pads to form electrical connections and wherein the high resistivity portion is positioned proximate each of the electrical connections.

Claim 5, the high resistivity portion is positioned in a plane generally perpendicular to the trailing edge face as the face opposite to the face marked 16 in Schott's Fig. 5 is defined as the trailing edge face.

Claim 6, the high resistivity portion is positioned in a plane generally parallel to the trailing edge face (Fig. 5).

Claim 7, the conductive trace 34A-D is positioned in a flex circuit.

Claim 8, the conductive trace 34A includes a trace bond pad 42A and a bonding component 22 is positioned on the trace bond pad. The bonding component providing an electrical conduit between the bond pad and the trace bond pad.

Claim 12, that heating element is adapted to provide heat to a bonding component 22 (Fig. 5), wherein the bonding component provides an electrical conduit. Between the bond pad 54 and the conductive trace 34.

Claim 13, above constructed device is a suspension assembly including: a suspension, a slider body supported by the suspension and having a trailing edge face and at least one bond pad positioned on the trailing edge face; and means 22 for providing an electrical connection between a conductive trace 34A and the at least one bond pad 54A using a heating element positioned on the suspension, the heating element having a high resistivity portion 51 and a low resistivity portion 53.

Claim 14, the above device having means 24 (Fig. 5) for insulating the conductive trace and the heating element.

Claim 15, tam et al further shows that the high resistivity portion has a smaller thickness than the low resistivity portion (Fig. 3D).

Claim 16, Tam et al further shows that the high resistivity portion includes an undulating pattern (Fig. 3A).

Claims 17 and 18, Tam et al's heating element can be positioned either at the 52B or plane 20 (Fig. 6).

Claim 19, wherein the means for providing are positioned on a flex circuit.

Claim 28, above constructed device is a suspension interconnect, including: a suspension 10, a conductive element 34 positioned on the suspension; a heating element positioned on the suspension including a low resistivity portion and a high resistivity portion; and an insulating component positioned between the conductive element and the heating element.

Claim 29, the high resistivity portion has a smaller thickness than the lower resistivity portion.

Claim 30, the high resistivity portion includes an undulating pattern.

Claim 31, wherein at least two bond pads are electrically interconnected to at least two conductive elements.

Claim 33, that heating element is adapted to provide heat to a bonding component 22 (Fig. 5), wherein the bonding component provides an electrical conduit. Between the bond pad 54 and the conductive trace 34.

2. Claims 9-11 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tam et al and Schott as applied to claims 1, 7, and 28 above, and further in view of Berg et al (US 6,704,256).

Claims 9-11 and 32, Tam shows a heating element, wherein the power is fed from the pulse generator 17, but fails to show the way of pass the power.

Berg et al shows a suspension assembly, wherein a single flex is used to pass the signal and power. It is a commonly used method of passing the signal and power

(Column 5, lines 33-39). One of ordinary skill in the art would have been motivated to use a flex for passing signal as well as the power for the heating element.

3. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tam et al and Schott as applied to claims 13 above, and further in view of Amemiya et al (US 6,002,550).

Claim 20, Schott show a means of ultrasonic is used for bonding (Column 5, lines 6-8). Amemiya et al shows that ultrasonic and heating are alternative used for bonding (Column 21, lines 57-62). One of ordinary skill in the art would have been motivated to include heating as means for bonding to heat a bonding component to provide an electrical conduct between the conductive trace and the at least one bond pad.

Claim 21, the bonding component is positioned on a portion of the conductive trace.

Response to Arguments

4. Applicant's arguments filed 06/06/2006 have been fully considered but they are not persuasive.

- Applicant argues: "There exists no teaching or suggestion that the ultrasonic bonding tool of Schott needs to have improved strength and stability to form this electrical connection. Thus, it appears that the combination of Schott and Tam et al. is made by merely a matter of hindsight and not objective evidence."

Examiner's answer: Tam et al (US 5,421,943) teaches: "In accordance with the principles of the present invention, a method of bonding small,

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temperature critical components to one another or to larger base components comprises forming a shaped heating element on a surface of first component or substrate" (Column 2, lines 3-7). It is clear that Tam teaches that the invention can be used not only for bonding a component to a larger base component, which is the case disclosed in Fig. 5, but also for bonding two **small components** together such as the trace and bonding pad in Scott (US 6,349,017). Tam et al further teaches that the heating element can be formed not only on substrate, which is the case of Tam et al's Fig. 5, but also on **surface of first component** such as the bonding pad in Scott (US 6,349,017).

- Applicant argues that there is no insulation component.

Examiner points out that Tam et al shows an insulation component 24 in Fig. 5).

- Rejection is proper and maintains.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date

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of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tianjie Chen whose telephone number is 571-272-7570. The examiner can normally be reached on 8:00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Nguyen can be reached on 571-272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


TIANJIE CHEN
PRIMARY EXAMINER